REMARKS

Claims 2-16 are active in the application. Claims 1, 17 and 18 were withdrawn from consideration in view of a restriction requirement, and have been canceled herein without prejudice as being drawn to a non-elected invention.

The Abstract was objected to for not including the process steps of the present invention. The Abstract has been amended to include the process steps of the present invention.

The title of the invention has been changed. The new title is more descriptive of the invention and claims.

Claim 7 has been amended to make it clearer. The scope of claim 7 has not been changed. Claim 7 is directed toward embodiments where the asperities are designed (e.g., shaped, varied in density, or patterned) according to the type of material depicted in the image. For example, in an area of the image overlying a towel or other fuzzy fabric, the asperities can be shaped to mimic the towel or fuzzy fabric. In an area over a tile or other smooth surface, the asperities can be small or nonexistent, for example.

Claims 2-16 were rejected under 35 USC 103(a) as being unpatentable over US Patent 6,010,808 to Naito et al. This rejection is traversed.

The present invention provides a method for forming a hard copy of an image that includes 3-dimensional information. Specifically, in the present invention, a transparent coating is formed on a recording medium (e.g. a printed picture). The transparent coating has asperities (i.e., small bumps or projections) that correspond to 3-dimensional information (or other features) in the underlying image. This aspect is described on page 8, lines 30-36, and in reference to Fig. 2. The asperities are made non-uniform in a manner that reflects the 3-dimensional nature of the underlying printed image. For example, the size, height, shape, patterning, or density (or other characteristics) of asperities can correspond to the depth or surface angle of the underlying portion of the image. Consequently, the asperities provide a 3-dimensional stereoscopic effect, thereby allowing a viewer to visualize the 3-dimensional nature of the image. For example, foreground areas can have relatively few, short asperities and so have a glossy appearance; background areas can have many, tall asperities and so have a matte

appearance. In this specific example, the graded glossy-matte appearance will indicate the distance of the underlying portions of the image. The transparent coating and asperities of the present invention thereby provides a "3-D" effect in the image. Also, in the present invention, the size, height, shape, patterning, density (or other characteristics) of asperities can correspond to materials (e.g. fabric, metal wood) depicted in the image. Also, the asperities can correspond to density of the image.

It is important to note that the present claims do not read on images with randomly distributed asperities, or uniformly sized, shaped, patterned, or distributed asperities. In the present invention, the characteristics of the asperities must correspond in some way to the underlying image. The asperities can correspond to 3-dimensional information in the underlying image (claim 2); the asperities can correspond to materials depicted in the underlying image (claim 7); or the asperities can correspond to detected density variation in the underlying image (claim 12). The present claims do not read on random patterns of asperities, a uniform distribution of asperities, or asperities that do not in some way correspond to the underlying image.

By comparison, Naito et al. teaches a rewritable thermal recording medium and method. In Naito et al., a heat-sensitive recording layer 5 permits the formation and alteration of images by heat. A protective layer 6 is provided over the recording layer 5. As correctly noted in the Office Action, Naito et al. does not teach asperities. Figs. 1B, 4B and 5 of Naito et al. do not show or suggest asperities. Figs. 1B, 4B and 5 illustrate the protective layer 6 as being smooth and uniform.

The Office Action argues that Fig. 1A of Naito et al. shows an uneven surface. This is not correct. Fig. 1A is a plan view, and consequently does not in any way illustrate or suggest that the surface is uneven. Naito et al. does not state or suggest that Fig. 1A shows an uneven surface. Each "display region" 7, 8, 9 is separated by a partition 10. As described in col. 13, lines 1-12, the partitions 10 function to prevent the mixing of recording materials (which have different colors) in the recording layer 5. Naito et al. does not teach or suggest that the partitions 10 or other features illustrated in Fig. 1A are uneven, produce asperities or can produce uneven surface features. There is no teaching, suggestion or motivation for the medium of Fig 1A to have asperities or any other kind of

uneven surface. Hence, the statement in the Office Action that Fig. 1A shows an uneven surface is simply wrong.

The Office Action argues that protrusions in the recording layer 5 will necessarily produce asperities in the protective layer 6. This is wrong for three reasons.

Firstly, Naito et al. does not teach or suggest that the recording layer 5 can have protrusions or bumps. The recording layer 5 is in all cases (Figs. 1, 4B and 5) illustrated as being a smooth, uniform layer. Even in Fig. 5, where the recording medium comprises microencapsulated pigments 42, the recording medium 5 and protective layer 6 are both illustrated as being smooth and uniform.

Secondly, the recording layer 5 is necessarily made of a meltable material. Melting the recording layer 5 changes the image, as illustrated in Figs. 2 and 3 and described in associated text. When melted, the recording layer will be liquid, and will have an extremely smooth surface free of protrusions. According to arguments in the Office Action, the protective layer 6 must therefore also have a smooth surface.

Thirdly, Figs. 1B, 4B and 5 are magnified views of the recording medium of Naito et al. Fig. 5, for example, clearly shows individual, magnified microencapsulated pigment particles 42. However, even though Figs. 1B, 4B and 5 are magnified, the protective layer 6 is illustrated as uniform and smooth. Hence, Figs. 1B, 4B and 5 suggest that the protective layer 6 does not have asperities, protrusions or other uneven surface features on the scale of the microscopic microencapsulated particles 42.

Claim 2 requires that the transparent coating have "asperities corresponding to 3-dimensional information" in the underlying image. Naito et al. completely lacks any teaching or suggestion of this feature. Even if the recording medium of Naito et al. had protrusions in the recording medium 5 (as argued in the Office Action), they would be randomly and/or uniformly distributed and would not "correspond to 3-dimensional information", as required by claim 2. As described in the present specification (and recited in claim 3), the "3-dimensional information" corresponding to the asperities can be distance to a surface, an angle of a surface, or location of edges, for example. Completely absent from Naito et al. is any teaching or suggestion to design, locate or pattern asperities according to the 3-dimensional information of an image. Accordingly, the rejection of claim 2 is erroneous and must be withdrawn.

The rejection of claim 3 is also erroneous. Claim 3 specifies the types of 3-dimensional information corresponding to the asperities. Naito et al. does not teach or suggest any relationship between asperities or surface features and 3-dimensional information in an image. Naito et al. does not teach or suggest anything about how to design, shape, pattern, or deposit asperities. The rejection of claim 3 is completely without merit and must be withdrawn.

The rejection of claim 4 is also erroneous. Claim 4 specifies that the asperities can be varied by height, density, frequency, pattern or transparent coat thickness. Any of these parameters can be varied according to 3-dimensional information in the image. Naito et al. by comparison completely lacks any teaching or suggestion to vary any of these parameters, and also lacks any teaching or suggestion to vary any of these parameters according to 3-dimensional information. Naito et al. does not teach or suggest anything about how to design, shape, pattern, or deposit asperities. The rejection of claim 4 is completely without merit and must be withdrawn.

The rejection of claim 5 is also erroneous. Naito et al. does not teach or suggest modulating an image recording unit according to digital image data including 3-dimensional information.

Claim 7, as amended, requires that the transparent coat layer has asperities that are created according to the materials represented in the image. For example, if the material represented in the image is bumpy or textured, then the asperities can be designed to represent or mimic the texture. Even if the recording medium of Naito et al. had asperities due to protrusions in the recording medium 5 (as argued in the Office Action), they would be randomly and/or uniformly distributed and would not be "created according to materials of objects forming said image." Naito et al. does not in any way teach or suggest that the protective layer 6 (or recording layer 5) can be shaped or have asperities according to materials depicted in an image. Accordingly, the rejection of claim 7 is erroneous and must be withdrawn.

The rejection of claim 9 is also erroneous. Naito et al. does not teach or suggest area extraction by analysis of digital image data.

The rejection of claim 10 is also erroneous. Naito et al. does not teach or suggest that shape data describing asperities can correspond to metal, resin, cloth, or wood

depicted in an underlying image. Naito et al. does not teach or suggest anything about how to design, shape, pattern, or deposit asperities. The rejection of claim 10 is completely without merit.

The rejection of claim 11 is also erroneous. Naito et al. does not teach or suggest that shape data describing asperities can include information concerning heights, formation frequency, formation density, or patterns of the asperities, or thickness of the transparent coat layer. Naito et al. does not teach or suggest anything about how to design, shape, pattern, or deposit asperities. The rejection of claim 11 is completely without merit.

Claim 12 requires analyzing to-dimensional image data to extract a surface area of an image, and then forming a transparent coat layer having asperities. Claim 12 requires that the asperities correspond to a detected density variation in the extracted surface area. Even if the recording medium of Naito et al. had protrusions in the recording medium 5 (as argued in the Office Action), they would be randomly and/or uniformly distributed and would not "correspond to detected density variation", as required by claim 12. Completely absent from Naito et al. is any teaching or suggestion to design, locate or pattern asperities according to the detected density variation of an image.

Naito et al. does not teach or suggest anything relating to forming asperities. Further, Naito et al. does not teach or suggest anything about asperities corresponding to a density variation (or any other variation or pattern). Naito et al. is completely silent with regard to asperities.

Accordingly, the rejection of claim 12 is erroneous and must be withdrawn.

The Office Action states that "It would have been obvious to analyze the image with the expectation of obtaining a more precise coating". However, claim 12, is not directed towards obtaining a "precise" coating. Claim 12 is directed toward a method for forming asperities in a manner that corresponds with density variations in the image data. Naito et al. does not teach or suggest anything about asperities or forming asperities in a manner that corresponds with density variations. Accordingly, the statements in the Office Action are erroneous and the rejection of claim 12 must be withdrawn.

The rejection of claim 13 is also erroneous. Naito et al. does not teach or suggest photoelectric scanning.

The rejection of claim 15 is also erroneous. Naito et al. does not teach or suggest that large asperities can be formed in areas where there exists large density variations.

Claims 2-16 were provisionally rejected on the ground of nonstatutory obviousness type double patenting over U.S. Patent Application 10/808,328. This rejection is traversed.

Claim 1 of U.S. Patent Application 10/808,328 recites a process where a transparent coating layer is deposited on image recorded areas of said recording medium. Claim 1 of U.S. Patent Application 10/808,328 recites causing clear droplets to fly from the recording head toward an image, curing the droplets while in flight, and depositing the cured droplets on the recording medium at the image recorded areas.

In sharp contrast, independent claims 2 and 7 of the instant application respectively require forming asperities corresponding to three-dimensional information of said image and forming asperities on a designated area using shape data that corresponds to materials of objects forming the image.

That is, claim 1 of U.S. Patent Application 10/808,328 and independent claims 2 and 7 of the present application are not mutually exclusive and are drawn to different subject matter. Thus, the provisional rejection should be withdrawn.

In view of the foregoing, it is respectfully requested that the application be reconsidered, that claims 2-16 be allowed, and that the application be passed to issue.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

A provisional petition is hereby made for any extension of time necessary for the continued pendency during the life of this application. Please charge any fees for such provisional petition and any deficiencies in fees and credit any overpayment of fees for the petition or for entry of this amendment to Attorney's Deposit Account No. 50-2041 (Whitham, Curtis & Christofferson P.C.).

Respectfully submitted,

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